New Title:

"Large-Calibre Gun Indoor Shooting Practice Device".

Clean Form:

Brief Description of the Drawings:

The above-stated and other novel features and aspects of this invention and how it may be reduced to practice may be understood better from the following detailed description of a preferred embodiment shown in the attached drawings, wherein:

Figure 1 is a longitudinal-cross section of an adaptor device, according to this invention, for a cylinder-type gun, such as a revolver or some large-calibre rifles.

Figure 2 is a longitudinal-cross section of an adaptor device, according to this invention, for a fixed-chamber gun, such as a large-calibre pistol.

Figure 3 is a longitudinal-cross section of a barrel of a pistol showing the adaptor device therein, according to an improved embodiment of the invention.

Figure 4 shows a liner tube of an adaptor device for a revolver, according to an improved embodiment of the invention.

Figure 5 shows a first embodiment of a rear tube of the adaptor device for the revolver of figure 4.

Figure 6 shows a second embodiment of a rear tube of the adaptor device for the revolver of figure 4.

Figure 7 shows a third embodiment of a rear tube of the adaptor device for revolvers.

Finally, figure 8 shows a fourth embodiment of a rear tube of the adaptor device for revolvers.

Detailed Description of Preferred Embodiments:

Describing in detail how the above-stated invention may be put to practice, figure 1 shows an embodiment of the adaptor device 11 of the present invention for a revolver, typically (the firearm itself is not depicted in the draw-

ings). The adaptor 11 comprises a tubular body 13 internally traversed by a longitudinal bore 15, preferably with rifling grooves 17 for increased precision.

The external diameter of the tube 13 is recessed at its forward part 19 by a step 21 for making a stop against the inlet mouth of the gun chamber. More precisely, the diameter of the forward part of the tube 13, between the step 21 and the outlet end 23, is that of the standard gun ammunition or bullet whereas the external diameter in the rear part 25 corresponds to the ammunition cartridge.

The rear end of the tube 13 itself is open, internally recessed and threaded for attaching a primer-holder 27 provided with a base 29 which continues in a circumpherencial flange 31. The base 29 is centrally traversed by a hole 33 extending towards a seat 35 for the primer 37, any of which marketed as "small pistol" o "large pistol" primers may be used. This seat 35 comprises a rear conical cavity, having a diameter decreasing towards the hole 33, and a forward cylindrical cavity, joined to one another, the latter closed in part by a primer retainer 39 formed by a cylindrical member having a central passage 41 coaxially aligned with the inlet end of the bore 15.

In an application of the adaptor 11 for ·44-calibre Magnum revolver, as it is popularly called, the full length of the unit 11 is 41·9 mm, broken down as: 7·8 mm forward length 19, 32·6 mm rear length 25 and 1·5 mm width of the flange 31 at the base 27. The diameters of these three parts are 10·9 mm and 11·6 mm for the front 19 and rear 25 tubular parts, respectively, and 13·1 mm for the base 29, whereas the diameter of the bore 15 is 4·5 or 5·5 mm according to the ammunition 43 to be used, the diameter of the gas passage hole 41 may be 1 mm and that of the seat 35 according to the size of the primer 37.

To load the adaptor 11, first the three members 13, 27 and 39 are disassembled, unscrewing the base 27 from the

tubular body 13 to uncover and take out the primer-latch 39. A conventional pistol primer 37 is placed on the seat 35 through the forward mouth of the base 27 and a pellet 43 or round shot, also conventional, such as of 4·5 or 5·5 mm, is placed in the chamber of the bore 15 through the rear mouth of the latter. The cylindrical primer-latch 39 is replaced again to separate the pellet 43 from the primer 37 and the base 27 is screwed back on to the tube 13.

The cylindrical member 39 is for retaining the primer 37 in its seat 35 where it may be struck by the firing pin of the gun through the hole 33 when the shooter presses the trigger (not shown). The expansion gasses produced by the detonation flow through the passage 41 and drive the pellet 43 through the bore 15, thereby producing the shot.

The basic structure of the embodiment of figure 1 requires some changes when the adaptor device of the invention is for use with a gun having a chamber, as is the case of a pistol, for example a ·45-calibre ACP pistol. The barrel 75 of the pistol is schematically drawn in figure 2 and is internally occupied in its entirety by the adaptor 81 of the present invention. The adaptor 81 comprises a liner tube 83 and a rear base 85. The latter is internally threaded for screwing on the primer-latch 87 which, in turn, is provided with a passage 89 for gasses recessed at its forward part to form a pellet-housing chamber 91.

The adaptor 81 is pushed into the barrel 75 through the chamber 77 until its outlet-end mouth 93 protrudes through the outlet mouth 79 of the barrel 75, revealing an external thread 95 for affixing a nut 97 for holding the adaptor 81 in place. The tube is further provided with an external circumpherencial groove for housing an O-ring 99 to hold the adaptor 81 fast inside the barrel 75, specially during firing, thereby assisting in the aim of the shot.

The entire length of the adaptor 81 for a Colt 1911 A1 is at least 127 mm, 11·4 mm of which correspond to the base, the

diameter of which is 12 mm. The middle part of the tube 83 which goes inside the barrel 75 of the pistol has a diameter slightly less than 11·4 mm.

A more preferred embodiment of the invention is set forth in figure 3 which schematically shows the barrel 75 of the pistol internally occupied by the adaptor 181 of the present invention. The adaptor 181 comprises an elongated liner tube 183 and a rear tube 187, shorter than the former, screwably closed behind by a base 185. The latter contains a housing for a primer 37. The shape of the combination of the base 185 and the rear tube 187 is similar to a standard-calibre ammunition and includes a circumpherencial recess 201 abutting against a circumpherencial step in the chamber 77 which normally retains a standard ammunition cartridge.

However, the overall length of the combination 185-187 is advantageously shorter that of standard-calibre ammunition as a means of protection against neglecting to take the liner 183 out before shooting with real ammunution.

The rear tube 187 includes the gas passage 89 recessed at its forward part to form a pellet chamber 91. Gasses coming from a just-fired primer 37 are accelerated and decompressed through this passage, taking advantage of Venturi's principle to provide a silencer.

The liner tube 183 is pushed into the pistol barrel 75 through the outlet mouth 79 until it abuts against the rear tube 187 loaded in the chamber 77. The oulet mouth 193 of the liner tube is externally threaded 95 and in part protrudes out of the mouth of the gun barrel 75. A nut 197 is then screwed onto the thread 95 to press against a sleeve 203 made from a deformible plastics material and which covers a part of the liner tube 183 after the thread 95. The nut 197 is tightened until the sleeve 203 expands diametrically to press against the internal wall of the barrel 75, thereby immobilizing the liner tube 183.

The liner tube 183 has two O-rings 199 housed in respective circumpherencial grooves adyacent to the rear end of the tube 183 to keep it centred inside the barrel 75 and, more importantly, maintain a gap between the metallic wall of the tube and that of the barrel 75 which preserves the rifling grooves inside the latter.

Figure 4 shows a liner tube 183' similar to the liner tube 183 of figure 3 but with a plastics rear end attachment 205 which is particularly useful revolver practice, notwithstanding it may be used with pistol liner tubes 183. The plastics rear end attachment is embodied by a short length of tube 205 made of a material known as "*DELRÍN*". The length of the liner tube 183' is such that the rear end 205 is at a scarce distance, advantageously in the order of a few tenths of a millimetre, from the forward end of the cylinder of the revolver (not illustrated), practically abutting against the forcing cone of the revolver barrel when the liner tube 183' is inside the revolver barrel and immobilized by the nut 197 expanding the sleeve 203. Use of the plastics rear-end attachment 205 provides for a quieter shot in revolvers. No accesory tools are needed for loading and unloading the pellet 43 .

The elongated liner tube 183' of figure 4, which stays fixed inside the gun during a firing round, is complemented by a second unit of the adaptor device 181' of the invention, formed by a short tubular member 11' having an external shape and size similar to standard-calibre ammunition for that gun, as illustrated in figures 5 and 6. This short tubular member 11', or "pseudobullet" as it could be termed, loads the pellet 43 and the primer 37 for each shot. That is to say, in contrast to the forward tubular member 183', the rear tubular member 11' is changed for each shot, by the automatic turn of the cylinder, and has to be reloaded before it may be used again. It may be seen that both members 183' and 11' of the adaptor 181' of the invention carry out different functions

in that, respectively, one downscales the dimensions of the gun barrel whereas the other loads ammunition of another calibre.

Describing in detail the embodiment of the tubular member 11' shown in figure 5, it essentially comprises a tube 13' having an external diameter which is recessed at its forward part 19 by a step 21 capable of abutting against the chamber inlet mouth of the gun cylinder. More precisely, the diameter of the forward part of the tube 13', between the step 21 and the outlet end 23', is that of the bullet or standard ammunition for the gun whereas the external diameter in the rear part 25 corresponds to the ammunition cartridge.

The rear end of the tube 13' itself is open, internally recessed and threaded for attaching a primer-holder 27 provided with a base 29 which continues in a circumpherential flange 31. The base 29 is centrally traversed by a hole 33 extending towards a seat 35 for the primer 37, generally any of which marketed as "*SMALL PISTOL*", "*SMALL RIFLE*", "*LARGE PISTOL*" or "*LARGE RIFLE*" primers may be used.

The interior of the cannon 207 includes a bore 15 extending towards the forward end 23' of the rear member 11' and dimensioned for housing the pellet 43. The bore 15 is communicated backwardly with a pasaje 41 coaxial therewith. The bore 15 of the cannon 207 has a recess 208 to reduce the diameter of the rear part to compensate for the cannon 207 moving forward against the plastics end 205 before the pellet exits. The recess 208 further stops the primer from passing through into the pellet chamber under the firing effect, specially when primers 37 of the "*SMALL*" type are used.

More precisely, the opening in the forward end 23' of the tube 13' is big enough for the cannon 207 to be pushed forward and stick out of the tube 13'. The cannon 207 has a circumpherential shoulder 209 which stops the cannon 207 from getting completely out of the tube 13'. Furthermore, a spring 211, which is wound around the cannon 207 and has one end

resting against the shoulder 209, urges the cannon 207 inside the tube 13'.

In order to load the rear member 11', the base 27 of the tube 13' is unscrewed, a fresh primer is placed on the seat 35 and the base 27 is placed back on again. A 4,5 mm pellet 43 or round shot, such as of the type marketed as "*GAMO*" or "*TORCAZ*" for example, is seated in the bore 15 through the forward mouth 23' of the rear tube 13' and the short tubular member 11' is inserted in one of the cylinder chambers , the gun ready for use. In this case, hollow cup-like or "*DIÁBOLO*" pellets may be used in spite of their greater structural fragility, since part of the energy generated by the gasses in expansion is consumed in forcing the cannon against the spring 211, thereby reducing the power available for accelerating the pellet and, consequently, the destructive effect of the primer charge on this kind of ammunition which could otherwise become beheaded by an excess charge.

When the shooter presses the trigger (not shown), the firing pin of the gun strikes the primer 37 in seat 35 through the hole 33. The expansion gasses under the effect of the detonation propel the cannon 207 together with the ammunition 43, compressing the spring 211. Part of these gasses cross through the passage 41 and simultaneously accelerate the pellet 43 inside the cannon 207. The cannon 207 is propelled out of the tube 13', through the hole 23' and strikes against the "*DELRIN*" material 205 of the long tube 183'. In this manner, a closed system is formed inside the liner tube wherein both the pellet 43 as well as the propellent gasses coming from the primer 37 are impelled. The pellet 43 shoots out of the little cannon 207, thereby producing the shot, and the cannon 207 is retracted thereafter back into the tube 13' again by the reaction of the spring 211.

With use, the cannon 207 repetitively strikes the plastics 205 and gradually wears it down with each shot until the exact headspace is shaped for a particular revolver to

accomodate the little cannon 207 after some use. The inclusion of the displaceable cannon 207 provides compensation for different cylinder lengths found in revolvers of a same .38 o .357MAG calibre, thereby providing a universal adaptor system for a given calibre and different gunmakers and models.

Figure 6 illustrates an alternative embodiment of the rear tubular member 11", which features a primer-latch 39' included between the primer seat 35 and the chamber housing the cannon 207'. The primer-latch 39' screws on to the same thread that attaches the base 27'. Apart from this, this embodiment of the tubular member posterior 11" is similar to the one of figure 5.

Figure 7 ilustrates an alternative embodiment of the adaptor device of figure 1 which essentially consists of a rear tubular unit 151' which operates as an adaptor in combination with the forward tubular unit 183' depicted in Figure 4. The object of this embodiment is to replace the displaceable cannon 207 of figures 5 and 6 with a tubular unit 151' of adjustable length, which the user may match to the length of the cylinder of his gun.

It comprises a base 155 which, at its forward part, features an internal thread 213 for attaching an intermediate tube 215 including a first stretch 41' of the gas passage. The intermediate tube 215 features in turn an internal thread 217 at its forward part for screwing on the short tube with adjustable penetration, the latter tube featuring the remaining parts of the gas passage stretch 41" and of the bore 15' for housing the pellet 43. The set formed by the base 155 and the intermediate tube 215 have diametrical and longitudinal dimensions corresponding to a standard-calibre ammunition cartridge of the gun whereas the forward tip of the pellet-holder tube 157 looks like a bullet of this calibre.

That is to say that the munition holder 157 is screwed into the intermediate tube 215 until the overall length of

the unit assembled by the three members 155, 215 and 157 equals the length of the cylinder (a little less, in fact, to avoid jamming the cylinder). A counternut 219 is further assembled on the external thread of the munition-holder tube 157 and further tightened against the intermediate tube 215 to stop the joint from lossening.

The base 155 is unscrewed from the intermediate tube 215 for loading the primer 37. The intermediate tube 215 may be integrated into a single piece with the base 155 if a fully-cylindrical seat is provided, such that the primer 37 is held therein by the pressure exerted against the cylindrical side-walls for enabling the primer 37 to be loaded from behind, through the firing-pin access hole 61.

Lastly, the alternative embodiment of the rear unit 151 featured in figure 8 supresses the intermediate tube such that the length of the unit is not screwingly regulated. Rather, the length of the munition-holder tube 157' is sized to the longest cylinder available on the market, such that the user should cut off the forward point 123 of the tube 157' to the right size if the cylinder of his gun is shorter.

Of course, changes, variations and aggregations may be made to any of the above-detailed embodiments, without departing from the scope nor the spirit of the invention. The same has been described by way of preferred embodiments, however those skilled in the art may suit it to other applications or introduce modifications without departing from the purview of the invention as set forth in the appended claims. For example, the base 29, 55, 85 may be press-fitted into the tube 13, 57, 83 instead of screwed onto the latter.